



THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of : DeLuca
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Examiner : Manlove, Shalie A.
Art Unit : 1755
Title : *Highly Reflective Interference Pigments with Dark Absorption Color*

Commissioner of Patents and Trademarks
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DECLARATION OF CARMINE DELUCA UNDER 37 C.F.R. §1.132

I, CARMINE DELUCA, do hereby declare as follows:

1. THAT I received a Bachelor of Art in Chemistry from New York University in 1961.
2. THAT I was employed as a Pigment Chemist, Supervisor of Pigment Research and finally as a Manager of Product Development while working for the Mearl Corp., as a Chemist from Aug 1961 until May 1996 (when Mearl was acquired by Engelhard Corp), and then while working for Engelhard, until my retirement on 31 Dec 2003.
3. THAT I am a co-inventor of the above-identified application.
4. THAT I am familiar with the application identified above and the Office Action and applied references rendered to date (e.g., U.S. Patents 4,192,691, 5,611,851, and 5,693,135).
5. Exhibit A is a drawdown comparison of experiments WH-468 and WH-434. WH-468 is a mica supported titanium dioxide coated pigment (substrate 260M), which was reduced at 800° C with ammonia gas for one hour (thus, a supported and reduced pigment). WH-434 is a substantially mica-free titanium dioxide pigment prepared as described in U.S. Pat. No. 5,611,851 (a substrate 260 USTM), which was reduced at 800° C with ammonia gas for one hour (thus, an unsupported and reduced pigment). Therefore, the pigment of WH-434 differs from the pigment in WH-468 in that WH-434 is an unsupported pigment. These pigments were compared by performing a drawdown, where each pigment suspended in a vehicle is

literally drawn down on a card containing a white portion and a black portion. This drawdown card shows that the unsupported reduced pigment of the present invention (WH-434), when compared to the supported pigment (WH-468) demonstrates a color change from a dull gold-orange (WH-468) to a darker olive green (WH-434). This color change also comprises a darker adsorption color when compared to the supported reduced pigment (WH-468), and thus, provides for better hiding.

6. Exhibit B is a drawdown comparison of reduced unsupported pigment versus non-reduced unsupported pigment. The reduced unsupported pigment (WCH434) in this comparison is a substantially mica-free titanium dioxide pigment, which was reduced at 800° C for 1 hour with ammonia gas. The non-reduced unsupported pigment (260 USTM) in this comparison is a substantially mica-free titanium dioxide pigment, which has not been reduced. These pigments were compared by performing a drawdown, where each pigment suspended in a vehicle is literally drawn down on a card containing a white portion and a black portion. The reduced unsupported pigment (WCH434) of the present invention has a color change from bright gold (260 USTM) to an olive green (WCH434). This color change also comprises a darker adsorption color when compared to the unsupported non-reduced pigment (260 USTM), and thus, provides for better hiding.
7. Exhibit C is a drawdown comparison of an unsupported reduced pigment (WH-507) versus unsupported non-reduced (WPK 96058). The WH-507 pigment is a substantially mica-free titanium dioxide pigment, which was reduced at 800° C with ammonia gas for one hour. The WPK 96058 pigment is a substantially mica free titanium dioxide pigment, which has not been reduced. These pigments were compared by performing a drawdown, where each pigment suspended in a vehicle is literally drawn down on a card containing a white portion and a black portion. This drawdown card shows that the unsupported reduced pigment of the present invention (WH-507), when compared to the unsupported non-reduced pigment (WPK 96058) demonstrates a color change from a light-green (WPK 96058) to a blue-green or turquoise (WH-507). This color change is even more apparent in the white portion of the card where the color goes from an almost completely transparent light red color by transmission (WPK 96058), to a blue-green or gray color (WH-507). This color change also comprises a darker adsorption color when compared to the supported reduced pigment (WPK 96058), and thus, provides for better hiding.
8. It was known by me that a pigment with improved color intensity and/or improved reflectivity would be obtained by removing the mica support (see, e.g., U.S. Patents 4,192,691 and 5,611,851). For example, a dull-gold titanium dioxide supported pigment would be expected to become a bright-gold titanium dioxide unsupported pigment. Further, it is my

opinion that a pigment with a darker adsorption color would be obtained by reducing the titanium dioxide of a mica supported pigment (*see, e.g.*, U.S. Patent 5,693,135), for example, a light-gold non-reduced mica supported pigment might be expected to become a dark-gold mica supported pigment upon reduction of the titanium dioxide.

9. However, the pigment of present invention formed by reducing a substantially substrate-free titanium dioxide pigment shows an unexpected change in color (*see, e.g.*, Exhibits A-C above).
10. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, of both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements so made may jeopardize the validity of the document, or application, or any patent issuing therefrom.

Respectfully submitted,

14 June 2005
Date

Carminé DeLuca
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